

German Combat and Gunnery Training — Preparing for Future Challenges

by Captain Maximilian Pritzl, Germany Army

“The timely and coordinated concentration (due to new intensities) to deliver devastating strikes will increasingly become a decisive leadership task. ...The strikes themselves must be conducted with recklessness and at a high tempo. When armoured forces encounter each other, they conduct the firefight with high intensity — often without (too time-consuming) target differentiation, particularly because so-called “hot spots” are predominantly taken under fire in an environment characterised by an increasing multispectral camouflage and well-established intercept ranges.”

- LTC Schneider
Combat Development Section,
German Armour School

Real armor soldiers think that “direction as indicated — destroy targets!” is an effective operational order. The world in which we live today is not that easy — armor troops have to comply with various mission profiles.

When the “new army for new tasks” structure was adopted, for the first time German army units and formations were designated as crisis reaction forces, and training standards and operational readiness levels were redefined.

While the German federal armed forces (Bundeswehr) restructures into the “army of the future” (to be accomplished by 2004), immediately available reaction

forces will be provided by armored combat forces, which will increase about 50 percent. As a result, the Bundeswehr is subjected to a fundamental change and will no longer be a “peacetime and training army” but become a “mission-oriented army.”

In this article, the term “crisis reaction forces” refers to units that include career/temporary-career soldiers and voluntarily enlisted other ranks. The term “augmentation forces” refers to units that include conscripts.

According to the directive from the German army chief of staff regarding the training concept for crisis reaction forces, “the leadership and unit-level training to be conducted by crisis reaction forces serves to prepare for an employment and has to comply with the various operation and employment possibilities of the overall task spectrum — especially with those of a combat operation.”

For this reason, the complementary training for reaction forces has to include one special training element in the following areas to be accomplished once a year:

- Rotation to the National Combat Training Centre (or Regional Training Centre North).
- Various combat exercises.
- Live firing at unit and/or formation levels.

The leader-training directive also addresses the augmentation forces. The directive stipulates that these companies have to rotate through the Regional Training Centre at least twice every 3 years. After completing an AGDUS-based two-party exercise (AGDUS is a MILES comparable system), the company commander has to lead his reinforced company during a combat exercise with both mock and live ammunition.

Principles Governing the Conduct of Combat Exercises

Today, armored combat troops cannot focus on an enemy whose actions are predetermined by his structure and doctrinal principles. However, when accomplishing their operational missions, armored combat troops are confronted with different enemies who make use of various employment procedures, including covert operations.

Armored combat troops must prepare themselves for these complex and varying conflict situations during unit-level crisis and contingent training, and, as in the past, for conducting combined-arms combat. At present and in the future, this kind of training will be conducted as a sequence of individual and unit-level training events across the various command echelons. Further qualification is offered at central training installations, such as the Regional Training Centre



North, and during the course-based leadership training conducted for field units and future military leaders at the German Armour School.

German armor forces use the following principles for live firing:

- Only the company commander is responsible for training his soldiers.
- Firing exercises with the main gun are to be controlled by the company commander.
- Combat exercises with mock/live ammunition are to be controlled by the superior command echelon.

Therefore, the gunnery training of German armor forces does not constitute an independent training phase, but an integral part of combat training. This becomes apparent if we visualize the training sequence of armor forces as a whole:

- Weapons and equipment training.
- Simulator-based gunnery training.
- Combat training.
- Gunnery with on-board weapons.
- Combat exercises with mock/live ammunition.

German armor troops learn how to fire their weapons system during the simulator-based gunnery training, this means that formal range practice does not occur. This becomes even more evident if we take a look at the final training phase of the simulator-based gunnery training.

During this training phase, the tank platoon being employed as the fire unit receives a tactical mission task, which it

has to accomplish according to the tactical doctrinal principles. The AGPT, a simulator system for training a tank platoon that is similar to the close combat tactical trainer, is generally used to complete this training. The AGPT is commanded by the platoon leader and controlled by the company commander. Thus, the tank platoon's firefight constitutes only one part of the execution of the tactical decision, which is made by the platoon leader.

Beginning with the first firing exercise, "MG exercise 1 (KS/ES/D)," this principle of tactical mission firing is taken up during live-firing practice. The platoon leader acts according to the company commander's intent to accomplish the unit's mission, employing his platoon as the fire unit. Although initially, only one main battle tank gets permission to fire, the tank platoon is assigned the appropriate amount of targets to be engaged. From the very beginning, training is conducted at tank platoon level. Appropriate fire control and maneuvering the tank platoon are determining factors in accomplishing the platoon's mission.

The practice-fire and live-fire exercises of the German armor corps clearly show the orientation along doctrinal tactical principles and the respective command echelons. At subunit level, the tank platoon will reach its field serviceability on successfully completing three consecutive firing exercises:

- Firefight of a main battle tank at platoon level (BK Üb 1).
- Firefight of the platoon at company level (BK Üb 2/3).

- Combat exercise of the (reinforced) platoon at company level (BK Üb 4).

At unit and formation levels, one exercise each will be conducted to reach serviceability in the field:

- Combat exercise of a (reinforced) company at battalion level (BK Üb 5).
- Combat exercise of the (reinforced) battalion at brigade level (BK Üb 6).

The training goal of the combat exercises with mock/live ammunition consists of correctly applying doctrinal tactical principles, orchestrating fire and movement, correctly choosing the most efficient weapons in cooperation with other branches, and orchestrating these weapons so that the weaknesses of one weapons system are compensated by the strengths of another weapons system.

Conducting combat exercises with mock/live ammunition at the level of the reinforced platoon is required for all armored battalions. The armored battalions of the crisis reaction forces conduct combat exercises with mock/live ammunition at (reinforced) company and (reinforced) battalion levels.

Utilization Concept for German Training Areas

Combined arms live firing has always occurred in the Bundeswehr, but usually only on a special occasions, it is often the focus of the organizer's annual planning, and its realization requires a lot of time and tremendous assets — especially for the control and safety organization.

The combined arms exercise aims at demonstrating the effects of the weapons employed by multiple branches presenting their interaction on the battlefield. Therefore, central-viewing stands were established for a limited number of spectators. This either causes an unrealistic compression of an exercise phase in a very confined area due to the limited number of observation possibilities, or the time-consuming task of relocating spectators to another observation point.

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During the planning phase of this demonstration, planners failed to account for the rapid course of the battle — especially one fought by armored combat troops. At any rate, these exercises constitute special projects for both the training area headquarters and for the forces involved, and are only conducted occasionally.

Normally, regular unit-level training takes place on the well-known firing ranges of the training areas, and is oriented toward the mandatory lanes and firing halts. This is the right approach because learning how to shoot means learning by doing, which requires using the existing infrastructure on the firing ranges.

The German Army Training Establishment Shilo/Canada (GATES) is one exception. GATES has firing ranges with dimensions that allow the realistic employment of a reinforced company and battalion, which are interconnected by corridors. There are no spectators preventing a realistic task organization on the battlefield. Tanks, mechanized infantry, and artillery stay together in the training area, under the uniform command of a tactical commander of a major formation, without having to accomplish any additional missions. Training results are very good because the first two criteria are met and the units have completed mandatory preliminary training courses, which is not an easy task.

The concept. Regularly scheduled combat exercises cannot be carried out on the training area’s firing ranges, which have been optimized specifically for formal combat exercises. All German firing ranges do not allow the regular extension of a combat sector or a company’s position area. Furthermore, the infrastructure of the practice firing ranges that were built

several decades ago was marked by tank trails and signs, which impeded realistic tactical maneuvering.

Changing the unrealistic training approach was taken into consideration by the new utilization concept for training areas, which was issued in 1998. Depending on the size of the training area, the training area headquarters must establish areas that allow subunits and reinforced formation-level units to conduct combat exercises with mock/live ammunition under realistic conditions.

While at training areas, company and battalion commanders must prepare their forces for employment intensively and realistically. The infrastructural preconditions have to be provided to allow the following training phases:

- Qualified training for general mission tasks from subunit level upward.
- Cooperation of different branches during combat exercises with or without mock/live ammunition, up to battalion/brigade levels.
- Preparing forces — especially crisis reaction forces — for tasks to be performed in the extended task spectrum.
- Establish full operational readiness — especially augmentation forces — during crisis preparation training.

As a result, there are three major innovations, which are consistently oriented toward the mission-training requirement,

and take the realistic combat and firing training of armored combat troops into consideration:

- All German training areas have to ensure that combat exercises can be carried out with or without mock/live ammunition.
- On German training areas, formal service firing ranges will only be used for a transitional period.
- Tactically sound maneuvering shall only be restricted if range operating, safety, or environmental regulations have to be followed.

Basic restructuring of German training areas has facilitated individual training such as checkpoint training, observation-point training, and objects-to-be-secured training. Thus, the provision of large areas for combat/firing exercises ensures the freedom of action of instructors and military leaders. Furthermore, it guarantees that training will be conducted under operational conditions.

It is important to note that the apparent extension of available maneuver space for combat/firing exercises on German training areas constitutes the best precondition for considerably improving leader abilities and skills at all levels. This is valid for combined arms combat as well as employment of combined forces. Figure 1 illustrates the dimensions of the new combat training boxes on German training areas.

To ensure the internal and external safety of these combat training boxes, additional target sector markers or prominent terrain features are used from time to time, depending on the terrain characteristics and the proximity of the respective training area boundaries. In this context, identifying combat training boxes that allow an in-stride firing practice constitutes a special challenge.



FTX With Live Firing	Width	Depth
Armor platoon	2000m	3000m
Armor platoon (reinforced)	2500m	4000m
Armor company (reinforced)	3000m	6000m
Armor battalion (reinforced)	5000m	15000m

Figure 1

The rationale that friendly combat vehicles can be easily identified and that identified targets are set up to ensure external safety is logical, but does not exclude all risks. Most of us remember combat vehicles shooting at unauthorized hard targets, bushes or other objects, because under blurred vision, they appear to be an identified target. To decrease the risk of maneuvering combat vehicles violating pertinent safety regulations, a range safety control management system was considered.

The Range Safety Control and Management System (RSCMS) for the Bergen Major Training Area

Five years ago, following the example of combat training centers, such as the U.S. Combat Maneuver Training Center at Hohenfels, establishing a German combat training center was discussed. During initial test trials, a combat training center prototype (GUZ prototype) was used to facilitate an AGDUS (BT 46)-based live simulation of combat operations at the reinforced company level. This prototype could be employed for different purposes, as both infrastructure and technical installations have undergone further development during the course of several construction phases.

The proposal to use and optimize this prototype as a firing safety system for live-fire exercises outside permanent firing ranges was finally adopted in April 2001.

The first construction phase of the overall system has a decisive advantage over all the conventional systems employed for establishing and maintaining firing safety. The responsible supervisor at the training area headquarters has numerous data for situation assessment in quasi-real time, and a means of communication for information transmission, enabling him to make a decision on clearing weapons systems, which is always based on the latest information. For the first time, he is quicker at making a decision, and therefore, at issuing range clearance for different firing phases.

The first test trial. During the first test trial of a combat exercise with mock/live ammunition, conducted at formation level by Armored Brigade 12 during June 2001, firing safety was ensured by a simple redundancy system in the terrain. An observer controller who knew the training area's characteristics trailed each platoon. During this combat exercise, the observer controller, the safety officer, and a control assistant used an armored trans-

port vehicle to ensure mobility. With this conventional equipment, it was only possible to support daytime firing because the weapons systems could not be observed in the dark without night-vision capability.

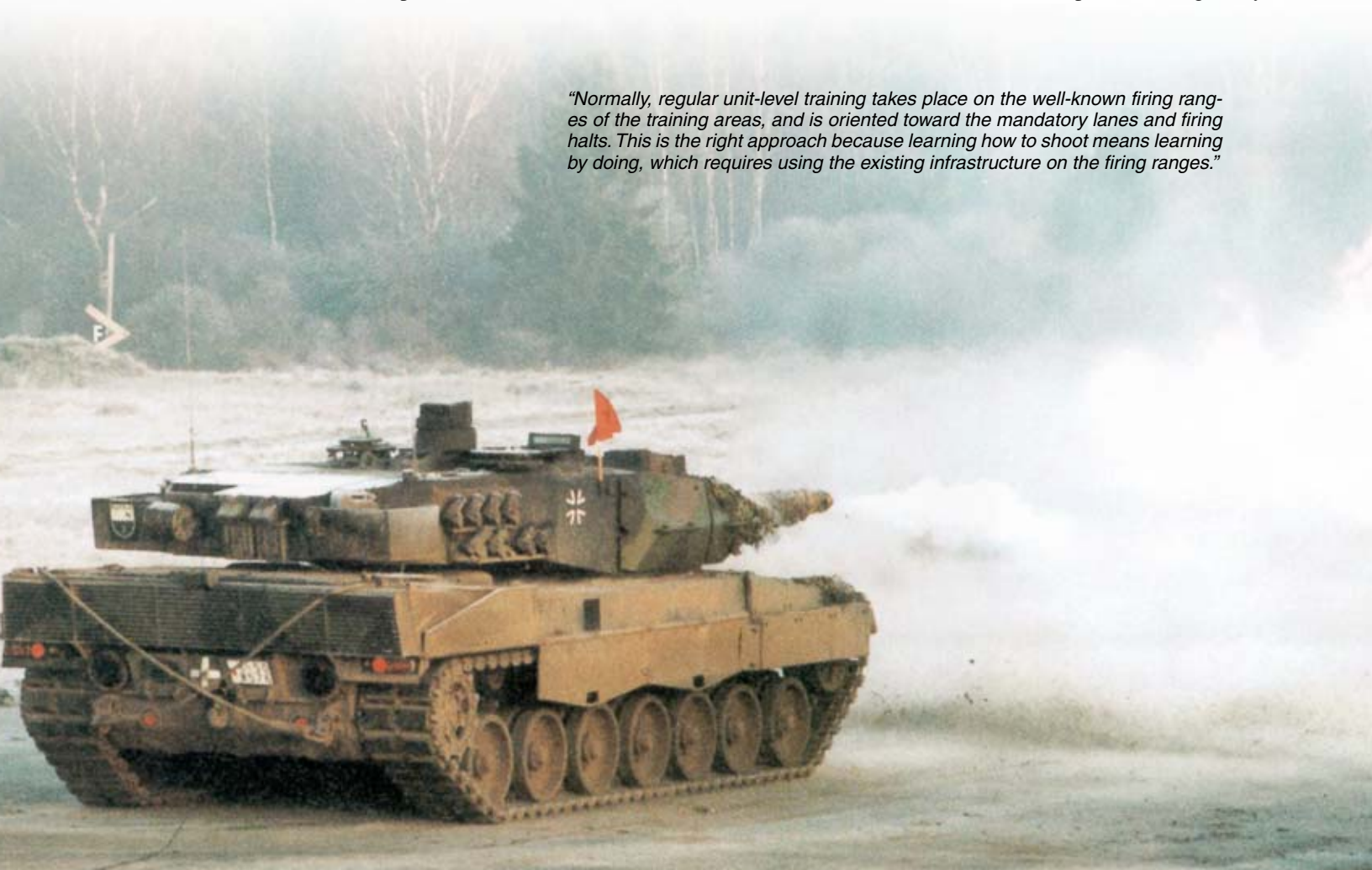
The observer controllers at the training area headquarters had their own radio sets and used the training area headquarters control net. They were tasked to confirm the position of vehicles to be observed by the control center (redundant spot report provided by the user identification unit), and to ensure external safety by monitoring the direction of the turret guns.

The modules of the RSCMS Bergen. The RSCMS Bergen consists of the basic organization, a control center, battle-field equipment, and a communications system.

The control center consists of three sections. During the combat exercise of Armoured Brigade 12, the tasks were allocated as follows:

- Section 1 for situation and introductory briefings into the overall system.
- Section 2 for the firing safety organization, with the responsible firing safety

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officer of the training area headquarters (in charge), the safety officer for overall safety and indirect fire, the liaison officer to the range officer in charge in accordance with the German Joint Service Regulation ZDv 44/10, and the G3 of Armoured Brigade 12 as the control assistant, with two officers employed as support personnel.

- Section 3 for the brigade's evaluation personnel to evaluate the exercise under the auspices of the deputy brigade commander (5 workstations); observers from the Armour School, Combat Development Section, Branch 7 (2 workstations); and one civilian technician (1 workstation).

To prepare this combat exercise, the following data has to be entered in the respective database:

- The tactical grouping (task organization) of the exercising units — enables a link to the user identification unit.

- All targets erected in the terrain (with an icon on the screen).

- The positions and firing areas for the exercise, which were reviewed by the training area headquarters after evaluation of the exercise notification.

- The arcs of fire of the main weapons systems (direct fire) and the danger areas (target areas for indirect fire weapons).

- The radio links (combat net radio/observer controller radio) had to be configured.

- Operational plans and phase sequences have to be entered.

At present, targets, positions, and surveyed areas for firing exercises still have to be entered manually in the form of an overlay. This is very time-consuming.

During this first combat exercise, the respective overlays provide nearly all required firing safety data. By enlarging or reducing the display, these targets and positions can be observed, which is important to this phase of the exercise. It is possible to track, with high accuracy, the position of the vehicles used by the exercising units, the training area headquarters, and other participants.

The user identification unit reports the position of the respective vehicles every 11 minutes or every 20 meters. The firing safety officer of the training area headquarters used handmade plastic overlays on the screen to quickly make a decision because the respective display, which should be electronically produced by the system, was not yet available.



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Battlefield equipment. With the exception of high-angle weapons and antitank helicopters, all vehicles and weapons systems, with a caliber greater than 20 millimeters, employed during the combat exercise were equipped with a user identification unit. This device determines the vehicle's position by using a global positioning system and the pertinent radio data transmission to the control center. For attaching and operating the user identification unit and the vehicle interface, special conversion kits (mount, adapter, and cable) are needed. These conversion kits have been optimized for employment in the combat training center and include all accessories such as user identification units and light fixtures. This technical equipment puts the supervisor at the training area headquarters in a position to immediately identify safety hazards on the screen.

The communications system. Four remote radio stations with stationary radio towers, a radio operations section, and a fixed radio network (optical fibre cables), enables communications between 19 radio circuits, and can provide radio coverage of 95 percent of the Bergen major training area. According to mission, out of these 19 radio circuits, up to eight different ones can be configured for each workstation, and up to four radio circuits can be monitored simultaneously using headphones available at each workstation. Out of these 19 radio circuits, eight can be chosen at the discretion of the subscriber. They can be used simultaneously by all control center workstations.

Any one of the eight available workstation circuits can be immediately chosen by a mouse-click. The configuration of the radio circuits can be changed at any time for each workstation. Furthermore, this system is equipped with a communications system that ensures the rapid exchange of information either by voice or by e-mail between the control center workstations. This system covers all safety-relevant radio circuits as required by the German Joint Service Regulation ZDv 44/10.

Other Performance Specifications of the Facilities

Digital map display. With the help of the communications system, the map of the Bergen major training area can be displayed in a scale as desired by the operator. Several settings, from a total view (scale of 1:4) to representing details (scale of 16:1, displayed at 100 x 100m), can be obtained. The map sheets used are based on the German electronic PC-MAP map series. By default, the scale of 1:50,000 is used.

Lists and charts. Lists and charts can be displayed at once with a single mouse-click. Position coordinates, associated targetry, lists of voice radio circuits, and code names can be saved as a file and are available at every workstation. Individual vehicle data can be displayed quickly and easily on the screen.

Targetry. Targets are conventionally activated. Target activation teams stay near the exercising units with target activation devices. Targets located near these teams

have to be cleared and activated by the observer controllers in cooperation with the responsible supervisor of the training area headquarters. Target information is only available if the target activation team or observer controller can see it, and if this pertinent information is sent to the control center via radio.

Employed personnel. The training area headquarters has two officers assigned to the control center of the Bergen range safety control and management system. The battlefield equipment (user identification unit and vehicle accessories) is prepared by six civilian employees of the training area headquarters prior to rotation, then managed by 16 employees during the actual employment on the training area.

The training area contractor employs approximately five employees on site. Two engineers direct the employment of the system, a technician assists in the control center and two technicians provide battlefield equipment support to training area headquarters personnel. All support personnel are required to be familiar with

necessary procedures to train the headquarters personnel. To ensure simple employment and compensate safety gaps, 15 additional observer controllers were employed in the terrain.

During the combat exercise with mock/live ammunition conducted by Armoured Brigade 12, the RSCMS Bergen clearly demonstrated and proved its functional capability. Thanks to the range safety control and management system, one reinforced company can use the four combat training boxes simultaneously. Furthermore, one reinforced battalion (task force) conducting a combat exercise can also use the entire major training area with mock/live ammunition under realistic conditions.

For the first time in the history of combat exercises with mock/live ammunition outside well-established firing ranges, the responsible supervisor of the training area headquarters was able to monitor the overall situation in quasi-real time and make a safety-related assessment.

This led to the unknown phenomenon that it had not been the safety officer who

asked the onsite observer controller whether the firing could begin, but the observer controller who asked the safety officer why the firing had not begun.

From a training area headquarters point of view, a realistic combat exercise with mock/live ammunition at unit and battalion level, which exploits realistic operational areas, will for the first time, not be obstructed by internal and external safety issues. Now, it is up to commanders and instructors to make intelligent use of this new realism for combat training success.



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